## **Supplemental Material**

**Title:** Heart Rate Variability in Association with Frequent Use of Household Sprays and Scented Products in SAPALDIA

### **Authors:**

Amar J Mehta, Martin Adam, Emmanuel Schaffner, Jean-Claude Barthélémy, David Carballo, Jean-Michel Gaspoz, Thierry Rochat, Christian Schindler, Joel Schwartz, Jan-Paul Zock, Nino Künzli, Nicole Probst-Hensch, and SAPALDIA-Team

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#### The SAPALDIA team:

*Study directorate:* T Rochat (p), JM Gaspoz (c), N Künzli (e/exp), LJS Liu (exp), NM Probst Hensch (e/g), C Schindler (s).

Scientific team: U Ackermann-Liebrich (e), JC Barthélémy (c), W Berger (g), R Bettschart (p), A Bircher (a), G Bolognini (p), O Brändli (p), C Brombach (n), M Brutsche (p), L Burdet (p), M Frey (p), U Frey (pd), MW Gerbase (p), D Gold (e/c/p), E de Groot (c), W Karrer (p), R Keller (p), B Knöpfli (p), B Martin (pa), D Miedinger (o), U Neu (exp), L Nicod (p), M Pons (p), F Roche (c), T Rothe (p), E Russi (p), P Schmid-Grendelmeyer (a), M Tamm (P), A Schmidt-Trucksäss (pa), A Turk (p), J Schwartz (e), D. Stolz (p), P Straehl (exp), JM Tschopp (p), A von Eckardstein (cc), JP Zellweger (p), E Zemp Stutz (e).

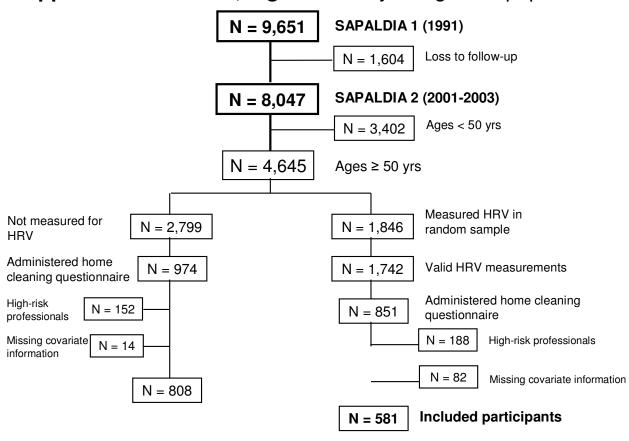
Scientific team at coordinating centers: M Adam (e/g), E Boes (g), PO Bridevaux (p), D Carballo (c), E Corradi (e), I Curjuric (e), J Dratva (e), A Di Pasquale (s), L Grize (s), D Keidel (s), S Kriemler (pa), A Kumar (g), M Imboden (g), N Maire (s), A Mehta (e), F Meier (e), H Phuleria (exp), E Schaffner (s), GA Thun (g) A Ineichen (exp), M Ragettli (e), M Ritter (exp), T Schikowski (e), G Stern (pd), M Tarantino (s), M Tsai (e), M Wanner (pa)

(a) allergology, (c) cardiology, (cc) clinical chemistry, (e) epidemiology, (exp) exposure, (g) genetic and molecular biology, (m) meteorology, (n) nutrition, (o) occupational health, (p) pneumology, (pa) physical activity, (pd) pediatrics, (s) statistics

Local fieldworkers: Aarau: S Brun, G Giger, M Sperisen, M Stahel, Basel: C Bürli, C Dahler, N Oertli, I Harreh, F Karrer, G Novicic, N Wyttenbacher, Davos: A Saner, P Senn, R Winzeler, Geneva: F Bonfils, B Blicharz, C Landolt, J Rochat, Lugano: S Boccia, E Gehrig, MT Mandia, G Solari, B Viscardi, Montana: AP Bieri, C Darioly, M Maire, Payerne: F Ding, P Danieli A Vonnez, Wald: D Bodmer, E Hochstrasser, R Kunz, C Meier, J Rakic, U Schafroth, A Walder.

Administrative staff: C Gabriel, R Gutknecht.

# Supplemental Material, Figure 1 Study design and population



**Supplemental Material, Table 1** Comparison of characteristics between selected study participants with heart rate variability measurements and non-selected participants who also reported cleaning activities in their home\*

|   | Selected participants | Non-selected participants |
|---|-----------------------|---------------------------|
| Characteristics                                   | (n=581)               | (n=808)                   |
| Age, yrs, median (IQR)                            | 59.9 (54.7, 65.8)     | 60.6 (55.3, 66.8)         |
| Male, (%)   | 59 (10.2)             | 89 (11.0)                 |
|   |                       |                           |
| Body mass index, kg/m <sup>2</sup> , median (IQR) | 25.8 (22.9, 28.7)     | 25.5 (22.8, 29.1)         |
| Smoking status, n (%)                             |                       |                           |
| Never   | 316 (54.4)            | 425 (52.6)                |
| Former  | 174 (30.0)            | 228 (28.2)                |
| Current   | 91 (15.7)             | 155 (19.2)                |
| ETS exposure, hours/day, n (%)                    |                       |                           |
| 0   | 471 (81.1)            | 661 (81.8)                |
| < 3   | 75 (12.9)             | 82 (10.2)                 |
| $\geq 3$  | 35 (6.0)              | 65 (8.0)                  |
| Alcohol consumption, n (%)                        |                       |                           |
| < 1 drink/day                                     | 384 (66.1)            | 513 (63.5)                |
| ≥ 1 drink/day                                     | 197 (33.9)            | 295 (36.5)                |
| Physical activity, hrs/week, n (%)                |                       |                           |
| < 0.5   | 269 (46.3)            | 402 (49.8)                |
| 0.5 - 2.0   | 200 (34.4)            | 241 (29.8)                |
| > 2.0   | 112 (19.3)            | 165 (20.4)                |
| Tertiary education level, n (%)                   |                       |                           |
| Low   | 68 (11.7)             | 92 (11.4)                 |
| Medium  | 407 (70.1)            | 593 (73.4)                |
| High  | 106 (18.2)            | 123 (15.2)                |
| Taking cardiac medication, n (%)                  | 136 (23.4)            | 199 (24.6)                |
| Symptoms of chronic obstruction, n (%)#           | 246 (53.4)            | 332 (54.3)                |
| Used any spray or scented product, n (%)          |                       |                           |
| Yes   | 515 (88.6)            | 698 (89.9)                |
| No  | 66 (11.4)             | 78 (10.1)                 |

<sup>\*</sup> Non-participants who reported cleaning in their home, being equal or older than 50 years of age, and not being in high risk occupations.

<sup>\*</sup>Symptoms of chronic obstruction was defined as having either pre-bronchodilator FEV<sub>1</sub>/FVC less than 0.70, or chronic bronchitis, or shortness of breath, *and* in absence of ever having asthma or taking respiratory medication; percentages are expressed relative to the 461 selected and 612 non-participants who completed pre-bronchodilator spirometry and did not report ever having asthma or taking respiratory medication.

Supplemental Material, Table 2 Characteristics of participants who reported on cleaning in their private homes by frequency of using household sprays and scented product (n=581)

|   | Unexposed    | Used         | cleaning spra | ys (composite s | score)       | Used air fre | shening sprays | s (days/week) | Used scented products (days/week) |              |              |  |
|---|--------------|--------------|---------------|-----------------|--------------|--------------|----------------|---------------|-----------------------------------|--------------|--------------|--|
| Characteristics   |              | 1            | 2             | 3               | ≥ 4          | < 1          | 1-3            | 4-7           | < 1                               | 1-3          | 4-7          |  |
| n participants  | 66           | 163          | 95            | 58              | 46           | 85           | 52             | 38            | 155                               | 87           | 76           |  |
|   | 60.4         | 59.7         | 62.2          | 59.4            | 57.6         | 59.4         | 62.0           | 61.7          | 59.2                              | 58.2         | 60.4         |  |
| Age, yrs, median (IQR)  | (56.1, 68.0) | (54.1, 65.0) | (56.9, 66.6)  | (54.0, 65.1)    | (54.5, 67.2) | (55.1, 65.6) | (56.2, 65.1)   | (53.5, 65.1)  | (54.0, 64.7)                      | (53.7, 63.9) | (56.1, 68.0) |  |
| Male, (%)   | 9 (13.6)     | 19 (11.4)    | 7 (7.4)       | 5 (8.6)         | 3 (6.5)      | 11 (12.9)    | 2 (3.9)        | 4 (10.5)      | 13 (8.4)                          | 8 (9.2)      | 9 (11.8)     |  |
|   | 24.6         | 25.5         | 26.2          | 27.1            | 26.2         | 26.2         | 26.8           | 27.3          | 26.6                              | 25.8         | 24.6         |  |
| BMI, kg/m2, median (IQR)  | (22.8, 27.4) | (22.9, 28.9) | (22.7, 28.4)  | (24.6, 31.1)    | (23.8, 29.2) | (24.0, 29.1) | (23.8, 30.7)   | (23.5, 30.5)  | (23.6, 29.4)                      | (22.9, 28.1) | (22.8, 27.4) |  |
| Smoking status, n (%)   |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| Never   | 44 (66.7)    | 84 (51.5)    | 48 (50.5)     | 29 (50.0)       | 22 (47.8)    | 38 (44.7)    | 29 (55.8)      | 18 (47.4)     | 83 (53.6)                         | 44 (50.6)    | 36 (47.4)    |  |
| Former  | 15 (22.7)    | 54 (33.1)    | 38 (40.0)     | 17 (29.3)       | 10 (21.7)    | 27 (31.8)    | 13 (25.0)      | 10 (26.3)     | 51 (32.9)                         | 25 (28.7)    | 25 (32.9)    |  |
| Current   | 7 (10.6)     | 25 (15.3)    | 9 (9.5)       | 12 (20.7)       | 14 (30.4)    | 20 (23.5)    | 10 (19.2)      | 10 (26.3)     | 21 (13.6)                         | 18 (20.7)    | 15 (19.7)    |  |
| ETS exposure, hours/day, n (%)  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| 0   | 56 (84.9)    | 130 (79.8)   | 81 (85.3)     | 44 (75.9)       | 31 (67.4)    | 69 (81.2)    | 40 (76.9)      | 28 (73.7)     | 133 (85.8)                        | 67 (77.0)    | 58 (76.3)    |  |
| < 3   | 7 (10.6)     | 23 (14.1)    | 11 (11.6)     | 8 (13.8)        | 11 (23.9)    | 10 (11.8)    | 10 (19.2)      | 7 (18.4)      | 17 (11.0)                         | 10 (11.5)    | 11 (14.5)    |  |
| ≥3  | 3 (4.5)      | 10 (6.1)     | 3 (3.2)       | 6 (10.3)        | 4 (8.7)      | 6 (7.1)      | 2 (3.9)        | 3 (7.9)       | 5 (3.2)                           | 10 (11.5)    | 7 (9.2)      |  |
| Alcohol consumption, n (%)  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| < 1 drink/day   | 45 (68.2)    | 110 (67.5)   | 59 (62.1)     | 44 (75.9)       | 27 (58.7)    | 56 (65.9)    | 33 (63.5)      | 26 (68.4)     | 99 (63.9)                         | 55 (63.2)    | 49 (64.5)    |  |
| ≥ 1 drink/day   | 21 (31.8)    | 53 (32.5)    | 36 (37.9)     | 14 (24.1)       | 19 (41.3)    | 29 (34.1)    | 19 (36.5)      | 12 (31.6)     | 56 (36.1)                         | 32 (36.8)    | 27 (35.5)    |  |
| Physical activity, hrs/week, n (%)  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| < 0.5   | 34 (51.5)    | 80 (49.1)    | 38 (40.0)     | 27 (46.7)       | 28 (60.9)    | 30 (35.3)    | 24 (46.2)      | 25 (65.8)     | 59 (38.1)                         | 34 (39.1)    | 46 (60.5)    |  |
| 0.5 - 2.0   | 17 (25.8)    | 53 (32.5)    | 43 (45.3)     | 22 (37.9)       | 14 (30.4)    | 38 (44.7)    | 18 (34.6)      | 9 (23.7)      | 67 (43.2)                         | 30 (34.5)    | 19 (25.0)    |  |
| > 2.0   | 15 (22.7)    | 30 (18.4)    | 14 (14.7)     | 9 (15.5)        | 4 (8.7)      | 17 (20.0)    | 10 (19.2)      | 4 (10.5)      | 29 (18.7)                         | 23 (26.4)    | 11 (14.5)    |  |
|   | 293          | 295          | 287           | 293             | 278.5        | 286          | 308.5          | 287           | 281                               | 290          | 293          |  |
| Uric acid, micromol/l, median (IQR)   | (243, 367)   | (243, 348)   | (232, 335)    | (265, 336)      | (237, 336)   | (250, 336)   | (242, 327.5)   | (245, 336)    | (235, 343)                        | (239, 337)   | (243, 367)   |  |
| Employment status, n (%)  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| Full/partially employed, in military, or  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| student   | 9 (13.6)     | 21 (12.9)    | 17 (17.9)     | 10 (17.2)       | 8 (17.4)     | 15 (17.7)    | 5 (9.6)        | 8 (21.0)      | 18 (11.6)                         | 10 (11.5)    | 13 (17.1)    |  |
| Housewife/husband   | 27 (40.9)    | 64 (39.3)    | 42 (44.2)     | 22 (37.9)       | 24 (52.2)    | 35 (41.2)    | 28 (53.9)      | 16 (42.1)     | 65 (41.9)                         | 35 (40.2)    | 31 (40.8)    |  |
| Retired, unemployed, sick/disabled, or  |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| other   | 30 (44.5)    | 78 (47.9)    | 36 (37.9)     | 26 (44.8)       | 14 (30.4)    | 35 (41.2)    | 19 (36.5)      | 14 (36.8)     | 72 (46.4)                         | 42 (48.3)    | 32 (42.1)    |  |
| Tertiary education level, n (%)   |              |              |               |                 |              |              |                |               |                                   |              |              |  |
| Low   | 8 (12.1)     | 18 (11.0)    | 12 (12.6)     | 8 (13.8)        | 7 (15.2)     | 7 (8.2)      | 8 (15.4)       | 5 (13.2)      | 20 (12.9)                         | 9 (10.3)     | 5 (6.6)      |  |
| Medium  | 47 (71.2)    | 112 (68.7)   | 72 (75.8)     | 38 (65.5)       | 36 (78.3)    | 63 (74.1)    | 36 (69.2)      | 28 (73.7)     | 102 (65.8)                        | 62 (71.3)    | 57 (75.0)    |  |
| High  | 11 (16.7)    | 33 (20.3)    | 11 (11.6)     | 12 (20.7)       | 3 (6.5)      | 15 (17.7)    | 8 (15.4)       | 5 (13.2)      | 33 (21.3)                         | 16 (18.4)    | 14 (18.4)    |  |
| Taking cardiovascular medication, n (%)<br>Markers and symptoms of obstructive lung | 11 (16.7)    | 31 (19.0)    | 29 (30.5)     | 13 (22.4)       | 14 (30.4)    | 24 (28.2)    | 10 (19.2)      | 11 (29.0)     | 40 (25.8)                         | 21 (24.1)    | 12 (15.8)    |  |
| disease, n (%)  | 34 (51.5)    | 59 (36.2)    | 37 (38.9)     | 26 (44.8)       | 22 (47.8)    | 41 (48.2)    | 22 (42.3)      | 16 (42.1)     | 57 (36.8)                         | 32 (36.8)    | 37 (48.7)    |  |

Supplemental Material, Table 3 Unadjusted average percent changes in major indices of HRV in association with frequent use

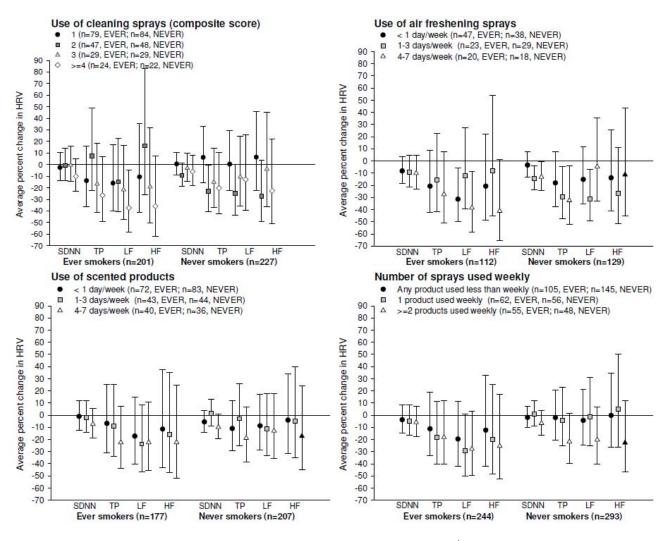
|                                  | 24-ho  | ur SDNN       | <u> </u> |               | requency | High frequency |        |               |
|----------------------------------|--------|---------------|----------|---------------|----------|----------------|--------|---------------|
|                                  | %      |               | %        | -             | %        | -              | %      |               |
| Exposure variable                | change | 95%CI         | change   | 95%CI         | change   | 95%CI          | change | 95%CI         |
| Composite score variable for     |        |               |          |               |          |                |        |               |
| cleaning sprays                  |        |               |          |               |          |                |        |               |
| Unexposed (n=66)                 |        | ref           |          | ref           |          | ref            |        | ref           |
| 1 (n=163)                        | -0.3   | (-7.6, 7.6)   | -3.8     | (-19.5, 15.0) | -3.5     | (-21.3, 18.2)  | 2.1    | (-20.1, 30.4) |
| 2 (n=95)                         | -4.6   | (-12.3, 3.7)  | -8.1     | (-24.5, 11.7) | -18.0    | (-34.4, 2.6)   | -3.9   | (-26.5, 25.8) |
| 3 (n=58)                         | -2.8   | (-11.5, 6.7)  | -16.0    | (-32.5, 4.7)  | -10.9    | (-30.6, 14.5)  | -2.1   | (-27.6, 32.5) |
| ≥ 4 (n=46)                       | -8.9   | (-17.5, 0.7)  | -20.5    | (-37.1, 0.5)  | -21.6    | (-40.0, 2.5)   | -18.9  | (-41.2, 11.9) |
| Air freshening spray (days/week) |        |               |          |               |          |                |        |               |
| Unexposed (n=66)                 |        | ref           |          | ref           |          | ref            |        | ref           |
| <1 (n=85)                        | -2.8   | (-10.1, 5.0)  | -12.2    | (-27.5, 6.3)  | -14.7    | (-30.6, 4.9)   | -8.0   | (-29.2, 19.4) |
| 1-3 (n=52)                       | -8.0   | (-15.8, 0.4)  | -19.7    | (-35.3, -0.4) | -20.1    | (-36.7, 1.0)   | -13.4  | (-35.6, 16.3) |
| 4-7 (n=38)                       | -10.7  | (-18.9, -1.6) | -20.9    | (-37.6, 0.2)  | -11.8    | (-31.8, 14.0)  | -12.0  | (-36.4, 21.7) |
| Scented products (days/week)     |        |               |          |               |          |                |        |               |
| Never (n=66)                     |        | ref           |          | ref           |          | ref            |        | ref           |
| <1 (n=155)                       | -3.7   | (-10.4, 3.5)  | -6.3     | (-21.3, 11.6) | -6.4     | (-23.3, 14.2)  | -2.9   | (-24.7, 25.1) |
| 1-3 (n=87)                       | 1.2    | (-6.6, 9.7)   | -3.0     | (-20.1, 17.8) | -8.6     | (-26.7, 13.9)  | -0.3   | (-24.7, 32.2) |
| 4-7 (n=76)                       | -9.1   | (-16.3, -1.3) | -18.3    | (-33.1, -0.3) | -10.6    | (-28.8, 12.2)  | -10.5  | (-33.1, 19.6) |
| Number of sprays used weekly     |        |               |          |               |          |                |        |               |
| Unexposed (n=66)                 |        | ref           |          | ref           |          | ref            |        | ref           |
| Any spray < 1 day/week (n=250)   | -2.1   | (-9.0, 5.3)   | -4.8     | (-19.6, 12.7) | -6.9     | (-23.3, 13.1)  | -2.0   | (-22.8, 24.4) |
| 1 spray ≥ 1 day/week (n=118)     | -2.6   | (-10.2, 5.5)  | -12.0    | (-27.1, 6.2)  | -14.2    | (-30.9, 6.4)   | -2.0   | (-24.8, 27.8) |
| ≥ 2 sprays ≥ 1 day/week (n=103)  | -6.6   | (-14.1, 1.4)  | -17.9    | (-32.3, -0.5) | -19.0    | (-35.1, 1.0)   | -13.1  | (-33.8, 14.0) |

<sup>&</sup>lt;sup>\*</sup> 24-hr SDNN, TP, LF, and HF were modeled on the logarithmic scale in multiple linear regression as a function of each exposure (discrete) in separate models and then transformed into average percent change relative to unexposed participants (n=66).

**Supplemental Material, Table 4** Adjusted average percent changes<sup>\*</sup> in major indices of HRV in association with frequency use of household spray and scented products

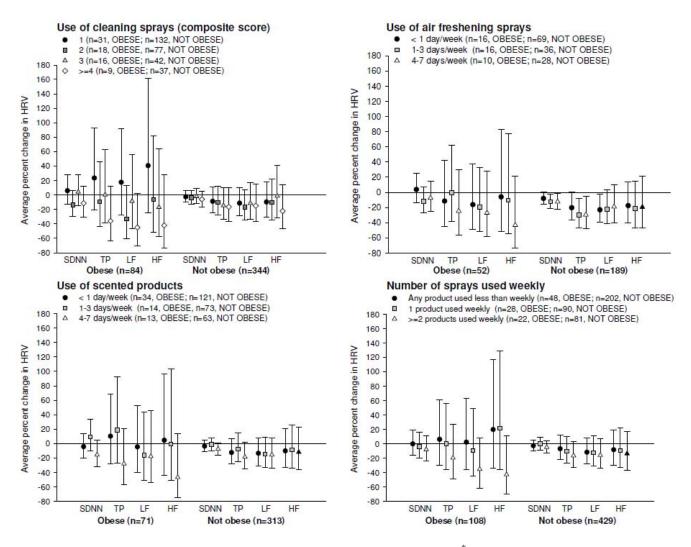
|   | 2        | 4-hour SDN    | our SDNN Total power |          |               | Low frequency |        |               | H       | High frequency |               |         |
|---|----------|---------------|----------------------|----------|---------------|---------------|--------|---------------|---------|----------------|---------------|---------|
|   |          |               | p-value              |          |               | p-value       |        |               | p-value |                |               | p-value |
|   |          |               | for                  |          |               | for           |        |               | for     |                |               | for     |
|   | <b>%</b> |               | ordinal              | <b>%</b> |               | ordinal       | %      |               | ordinal | %              |               | ordinal |
| Exposure variable                         | change   | 95%CI         | trend                | change   | 95% CI        | trend         | change | 95% CI        | trend   | change         | 95 % CI       | trend   |
| Composite score variable for              |          |               |                      |          |               |               |        |               |         |                |               |         |
| cleaning sprays                           |          |               |                      |          |               |               |        |               |         |                |               |         |
| Unexposed (n=66)                          |          | ref           |                      |          | ref           |               |        | ref           |         |                | ref           |         |
| 1 (n=163)                                 | -1.0     | (-8.1, 6.6)   |                      | -3.8     | (-19.3, 14.6) |               | -6.6   | (-23.0, 13.4) |         | -2.2           | (-23.5, 25.0) |         |
| 2 (n=95)                                  | -5.9     | (-13.6, 2.4)  | 0.20                 | -10.7    | (-26.9, 9.1)  | 0.04          | -20.6  | (-36.4, -1.0) | 0.06    | -10.5          | (-32.4, 18.4) | 0.09    |
| 3 (n=58)                                  | -0.5     | (-9.5, 9.4)   | 0.20                 | -12.1    | (-29.8, 10.0) | 0.04          | -11.1  | (-30.7, 14.0) | 0.00    | -7.5           | (-32.5, 26.7) | 0.09    |
| $\geq$ 4 (n=46)                           | -7.0     | (-16.2, 3.2)  |                      | -20.5    | (-37.8, 1.7)  |               | -21.3  | (-40.1, 3.3)  |         | -26.5          | (-47.9, 3.7)  |         |
| Air freshening spray (days/week)          |          |               |                      |          |               |               |        |               |         |                |               |         |
| Unexposed (n=66)                          |          | ref           |                      |          | ref           |               |        | ref           |         |                | ref           |         |
| <1 (n=85)                                 | -6.1     | (-13.3, 1.8)  | 0.01                 | -19.0    | (-33.9, -0.7) | 0.01          | -21.8  | (-36.6, -3.6) | 0.09    | -15.4          | (-36.4, 12.6) | 0.12    |
| 1-3 (n=52)                                | -12.1    | (-19.9, -3.5) | 0.01                 | -22.8    | (-39.0, -2.3) | 0.01          | -21.0  | (-38.0, 0.6)  | 0.09    | -16.7          | (-40.1, 15.7) | 0.12    |
| 4-7 (n=38)                                | -11.4    | (-20.2, -1.7) |                      | -29.3    | (-45.6, -8.1) |               | -21.1  | (-39.7, 3.4)  |         | -26.0          | (-48.8, 6.8)  |         |
| Scented products (days/week)              |          |               |                      |          |               |               |        |               |         |                |               |         |
| Never (n=66)                              |          | ref           |                      |          | ref           |               |        | ref           |         |                | ref           |         |
| <1 (n=155)                                | -3.6     | (-10.4, 3.8)  | 0.12                 | -8.6     | (-23.5, 9.2)  | 0.07          | -11.2  | (-27.0, 8.1)  |         | -6.1           | (-27.9, 22.3) | 0.22    |
| 1-3 (n=87)                                | 0.4      | (-7.4, 9.0)   | 0.12                 | -3.4     | (-20.7, 17.6) | 0.07          | -14.3  | (-31.1, 6.6)  |         | -6.7           | (-30.4, 25.1) | 0.22    |
| 4-7 (n=76)                                | -8.6     | (-15.9, -0.5) |                      | -20.0    | (-34.7, -2.0) |               | -15.6  | (-32.6, 5.7)  | 0.15    | -17.9          | (-39.3, 11.0) |         |
| Number of sprays used weekly              |          |               |                      |          |               |               |        |               |         |                |               |         |
| Unexposed (n=66)                          |          | ref           |                      |          | ref           |               |        | ref           |         |                | ref           |         |
| Any spray $< 1$ day/week (n=250)          | -2.3     | (-8.9, 4.7)   | 0.33                 | -4.9     | (-19.4, 12.2) | 0.04          | -9.2   | (-24.7, 9.5)  | 0.04    | -3.8           | (-24.2, 22.0) | 0.10    |
| 1 spray $\geq$ 1 day/week (n=118)         | -0.9     | (-8.5, 7.2)   | 0.55                 | -8.6     | (-24.2, 10.3) | 0.04          | -11.8  | (-28.7, 9.1)  | 0.04    | -3.9           | (-26.7, 26.0) | 0.10    |
| $\geq$ 2 sprays $\geq$ 1 day/week (n=103) | -5.3     | (-12.8, 2.9)  |                      | -17.2    | (-31.9, 0.7)  |               | -20.0  | (-35.9, -0.2) |         | -20.5          | (-40.0, 5.5)  |         |

<sup>\*</sup> Each variable HRV metric was modeled on the logarithmic scale in multiple linear regression as a function of each exposure variable (continuous, or categorical) in separate models, and adjusted for gender, age, age squared, body mass index, body mass index squared, alcohol consumption, physical activity, smoking status, environmental tobacco smoke exposure, education, employment status, cardiac medication, uric acid levels, street and railway noise, seasonal effects and study area.

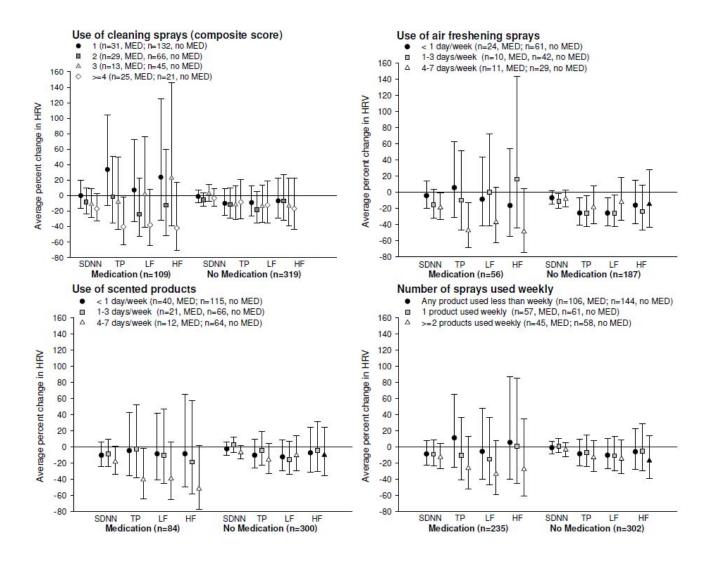


**Supplemental Material, Figure 2** Adjusted average percent changes\* in 24-hour SDNN, TP, LF, and HF in association with use of cleaning sprays, air freshening sprays, scented products, and with number of sprays used weekly after stratification by smoking status.

\* 24-hr SDNN, TP, LF, and HF were modelled on the logarithmic scale in multiple linear regression as a function of each exposure in separate models and then transformed into average percent change relative to unexposed participants (n=22, ever; n=44, never), after adjustment for gender, age, age<sup>2</sup>, bmi, bmi<sup>2</sup>, alcohol consumption, physical activity, smoking status, environmental tobacco smoke exposure, education, employment status, cardiovascular medication intake, uric acid levels, street and railway noise, traffic-related particulate matter, seasonal effects and study area.



Supplemental Material, Figure 3 Adjusted average percent changes in 24-hour SDNN, TP, LF, and HF in association with use of cleaning sprays, air freshening sprays, scented products, and with number of sprays used weekly after stratification by obesity (bmi ≥ 30 kg/m²). \*24-hr SDNN, TP, LF, and HF were modelled on the logarithmic scale in multiple linear regression as a function of each exposure in separate models and then transformed into average percent change relative to unexposed participants (n=10, obese; n=56, not obese), after adjustment for gender, age, age², bmi, bmi², alcohol consumption, physical activity, smoking status, environmental tobacco smoke exposure, education, employment status, cardiovascular medication intake, uric acid levels, street and railway noise, traffic-related particulate matter, seasonal effects and study area.



**Supplemental Material, Figure 4** Adjusted average percent changes<sup>\*</sup> in 24-hour SDNN, TP, LF, and HF in association with use of cleaning sprays, air freshening sprays, scented products, and with number of sprays used weekly after stratification by cardiovascular medication intake.

\* 24-hr SDNN, TP, LF, and HF were modelled on the logarithmic scale in multiple linear regression as a function of each exposure in separate models and then transformed into average percent change relative to unexposed participants (n=11, medication (MED); n=23, no medication (NO MED)), after adjustment for gender, age, age squared, body mass index, body mass index squared, alcohol consumption, physical activity, smoking status, environmental tobacco smoke exposure, education, employment status, cardiovascular medication intake, uric acid levels, street and railway noise, traffic-related particulate matter, seasonal effects and study area.

**Supplemental Material, Table 5** Adjusted average percent changes in major indices of nighttime HRV in association with frequency use of household spray and scented products

|                                  | 24-hour SDNN Total power p-value |               |         |        |               |         |  |  |
|----------------------------------|----------------------------------|---------------|---------|--------|---------------|---------|--|--|
|                                  |                                  |               |         | •      | p-value       |         |  |  |
|                                  |                                  |               | for     |        |               | for     |  |  |
|                                  | %                                |               | ordinal | %      |               | ordinal |  |  |
| Exposure variable                | change                           | 95%CI         | trend   | change | 95%CI         | trend   |  |  |
| Composite score variable for     |                                  |               |         |        |               |         |  |  |
| cleaning sprays                  |                                  |               |         |        |               |         |  |  |
| Unexposed (n=66)                 |                                  | ref           |         |        | ref           |         |  |  |
| 1 (n=163)                        | -3.9                             | (-11.3, 4.1)  |         | -2.0   | (-17.3, 16.2) |         |  |  |
| 2 (n=95)                         | -10.4                            | (-18.1, -2.0) | 0.31    | -13.1  | (-28.1, 4.1)  | 0.27    |  |  |
| 3 (n=58)                         | -3.9                             | (-13.1, 7.3)  | 0.51    | 1.0    | (-18.9, 25.9) | 0.27    |  |  |
| ≥ 4 (n=46)                       | -4.9                             | (-15.6, 6.2)  |         | -14.8  | (-32.3, 8.3)  |         |  |  |
| Air freshening spray (days/week) |                                  |               |         |        |               |         |  |  |
| Unexposed (n=66)                 |                                  | ref           |         |        | ref           |         |  |  |
| <1 (n=85)                        | -9.5                             | (-18.1, 0.2)  | 0.17    | -9.5   | (-26.7, 10.2) | 0.18    |  |  |
| 1-3 (n=52)                       | -10.4                            | (-20.5, 0.6)  | 0.17    | -16.5  | (-33.6, 5.9)  | 0.10    |  |  |
| 4-7 (n=38)                       | -11.3                            | (-21.3, 1.2)  |         | -13.9  | (-33.6, 11.6) |         |  |  |
| Scented products (days/week)     |                                  |               |         |        |               |         |  |  |
| Never (n=66)                     |                                  | ref           |         |        | ref           |         |  |  |
| <1 (n=155)                       | -5.8                             | (-13.1, 3.0)  | 0.28    | -3.0   | (-18.1, 15.0) | 0.20    |  |  |
| 1-3 (n=87)                       | -3.0                             | (-11.3, 6.2)  | 0.20    | -5.8   | (-22.1, 13.9) | 0.20    |  |  |
| 4-7 (n=76)                       | -6.8                             | (-15.6, 2.0)  |         | -11.3  | (-26.7, 8.3)  |         |  |  |
| Number of sprays used weekly     |                                  |               |         |        |               |         |  |  |
| Unexposed (n=66)                 |                                  | ref           |         |        | ref           |         |  |  |
| Any spray < 1 day/week (n=250)   | -4.9                             | (-12.2, 3.0)  | 0.54    | -3.9   | (-18.9, 12.7) | 0.42    |  |  |
| 1 spray ≥ 1 day/week (n=118)     | -2.0                             | (-10.4, 7.3)  | 0.54    | -3.0   | (-19.7, 17.4) | 0.42    |  |  |
| ≥ 2 sprays ≥ 1 day/week (n=103)  | -5.8                             | (-13.9, 3.0)  |         | -8.6   | (-25.2, 10.5) |         |  |  |

Each variable HRV metric was modeled on the logarithmic scale in multiple linear regression as a function of each exposure variable (continuous, or categorical) in separate models, and adjusted for gender, age, age squared, body mass index, body mass index squared, alcohol consumption, physical activity, smoking status, environmental tobacco smoke exposure, education, employment status, cardiac medication, uric acid levels, street and railway noise, seasonal effects and study area.

Supplemental Material, Table 6 Adjusted average percent changes in major indices of HRV in association with frequent use

household spray and scented products

|   | %      |               | %      |               | %      |               | %      |               |
|---|--------|---------------|--------|---------------|--------|---------------|--------|---------------|
| Exposure variable                       | change | 95%CI         | change | 95%CI         | change | 95%CI         | change | 95%CI         |
| Composite score variable for cleaning   | _      |               |        |               |        |               |        |               |
| sprays                                  |        |               |        |               |        |               |        |               |
| Never or $\leq$ 1 (n=139)               |        | ref           |        | ref           |        | ref           |        | ref           |
| 2 (n=95)                                | -5.2   | (-11.1, 1.1)  | -8.1   | (-21.1, 7.0)  | -16.5  | (-29.5, -1.3) | -9.0   | (-26.5, 12.5) |
| 3 (n=58)                                | 0.3    | (-7.2, 8.3)   | -9.5   | (-24.6, 8.5)  | -6.5   | (-23.5, 14.4) | -6.0   | (-27.1, 21.3) |
| ≥ 4 (n=46)                              | -6.3   | (-14.3, 2.4)  | -18.2  | (-33.8, 1.0)  | -17.4  | (-34.6, 4.4)  | -25.3  | (-44.4, 0.4)  |
| Air freshening spray (days/week)        |        |               |        |               |        |               |        |               |
| Never or < 1 (n=151)                    |        | ref           |        | ref           |        | ref           |        | ref           |
| 1-3 (n=52)                              | -8.7   | (-15.6, -1.2) | -12.1  | (-28.1, 7.4)  | -8.1   | (-25.3, 13.1) | -7.8   | (-30.2, 22.0) |
| 4-7 (n=38)                              | -7.8   | (-15.8, 0.9)  | -19.2  | (-35.8, 1.7)  | -7.7   | (-27.2, 17.0) | -17.7  | (-40.3, 13.2) |
| Scented products (days/week)            |        |               |        |               |        |               |        |               |
| Never or < 1 (n=221)                    |        | ref           |        | ref           |        | ref           |        | ref           |
| 1-3 (n=87)                              | 3.1    | (-3.1, 9.7)   | 3.0    | (-11.4, 19.7) | -6.7   | (-20.9, 10.2) | -2.3   | (-21.8, 22.0) |
| 4-7 (n=76)                              | -6.2   | (-12.3, 0.3)  | -14.9  | (-27.6, 0.1)  | -8.4   | (-23.4, 9.6)  | -14.3  | (-32.6, 9.0)  |
| Number of sprays used weekly            |        |               |        |               |        |               |        |               |
| Never or any spray < 1 day/week (n=316) |        | ref           |        | ref           |        | ref           |        | ref           |
| 1 spray ≥ 1 day/week (n=118)            | 1.0    | (-4.4, 6.7)   | -4.7   | (-16.4, 8.6)  | -4.6   | (-17.7, 10.6) | -0.8   | (-17.8, 19.8) |
| ≥ 2 sprays ≥ 1 day/week (n=103)         | -3.4   | (-9.0, 2.5)   | -13.7  | (-25.2, -0.6) | -13.5  | (-26.4, 1.6)  | -17.9  | (-33.1, 0.8)  |

<sup>24-</sup>hr SDNN, TP, LF, and HF were modeled on the logarithmic scale in multiple linear regression as a function of each exposure (discrete) in separate models and then transformed into average percent change relative. All effect estimates are relative to unexposed participants (n=66) in combination with participants who used specific product(s) of interest < 1 day/week, and are adjusted for gender, age, age², bmi, bmi², alcohol consumption, physical activity, smoking status, ETS exposure, education, employment status, cardiovascular medication intake, uric acid levels, street and railway noise, traffic-related PM<sub>10</sub>, seasonal effects and study area.